

There is enclosed a new optical signal detection scheme by means of converting transmitted optical RZ pulses to NRZ pulses. An optical fiber transmission system which uses the RZ format as the transmission format, and uses an optical pulse transformer to transform the optical RZ format to NRZ format in front of the receiver, then uses the NRZ format as the detection format at the receiver. One optical pulse transformer, which comprises an optical pre-amplifier, an optional optical filter and a span of normal dispersion fiber to transform high power optical RZ pulses to optical NRZ pulses by the combination effects of self-phase modulation and normal dispersion, is proposed and demonstrated. The tolerances for both the generalized timing jitter and amplitude jitter are increased significantly by using this invention. The Q factor is also increased by as much as 5.4 dB, which is a significant improvement on system performance.